

**Bonneville Power Administration  
Fish and Wildlife Program FY99 Proposal Form**

**Section 1. General administrative information**

**Restore Moses Lake Recreational Fishery**

Bonneville project number, if an ongoing project 9502800

Business name of agency, institution or organization requesting funding  
Washington Department of Fish and Wildlife

Business acronym (if appropriate) WDFW

Proposal contact person or principal investigator:

Name	Joe Foster
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Subcontractors. List one subcontractor per row; to add more rows, press Alt-Insert from within this table

Organization	Mailing Address	City, ST Zip	Contact Name
N/A			

NPPC Program Measure Number(s) which this project addresses.  
10.8B.19

NMFS Biological Opinion Number(s) which this project addresses.  
N/A

Other planning document references.

*If the project type is "Watershed" (see Section 2), reference any demonstrable support from affected agencies, tribes, local watershed groups, and public and/or private landowners, and cite available documentation.*

N/A

*Subbasin.*

*Crab Creek*

*Short description.*

*Restore/enhance the recreational fishery for trout and warmwater game fish species in Moses Lake, a 6,800 acre natural lake which was once the premier resident species fishery in the Columbia Basin area of central Washington.*

## **Section 2. Key words**

<i>Mark</i>	<i>Programmatic Categories</i>	<i>Mark</i>	<i>Activities</i>	<i>Mark</i>	<i>Project Types</i>
	<i>Anadromous fish</i>		<i>Construction</i>		<i>Watershed</i>
<i>X</i>	<i>Resident fish</i>		<i>O &amp; M</i>		<i>Biodiversity/genetics</i>
	<i>Wildlife</i>		<i>Production</i>	<i>*</i>	<i>Population dynamics</i>
	<i>Oceans/estuaries</i>	<i>*</i>	<i>Research</i>	<i>*</i>	<i>Ecosystems</i>
	<i>Climate</i>	<i>X</i>	<i>Monitoring/eval.</i>		<i>Flow/survival</i>
	<i>Other</i>	<i>*</i>	<i>Resource mgmt</i>		<i>Fish disease</i>
			<i>Planning/admin.</i>		<i>Supplementation</i>
			<i>Enforcement</i>	<i>X</i>	<i>Wildlife habitat en-</i>
			<i>Acquisitions</i>		<i>hancement/restoration</i>

*Other keywords.*

*Ecological interactions, water quality monitoring, recreational fishery enhancement*

## **Section 3. Relationships to other Bonneville projects**

<i>Project #</i>	<i>Project title/description</i>	<i>Nature of relationship</i>
<i>N/A</i>		

## **Section 4. Objectives, tasks and schedules**

### **Objectives and tasks**

<i>Obj 1,2,3</i>	<i>Objective</i>	<i>Task a,b,c</i>	<i>Task</i>
<i>1</i>	<i>Determine factors currently limiting the production and/or recruitment of bass, crappie, bluegill, perch and trout to the</i>	<i>a</i>	<i>Review all existing information on the fisheries and ecology of Moses Lake</i>

	recreational fishery of Moses Lake		
		b	Collect water quality, habitat, and fisheries information currently unavailable, but required for limiting factors assessment
		c	Evaluate all information to develop a list of possible factors contributing to the decline in populations of target species and the dependant recreational fishery
2	Identify the most feasible measures for restoring desirable fish populations and recreational fisheries in Moses Lake	a	Assess the availability and current use of spawning and rearing habitat for all major fish species
		b	Collect detailed hydrological and limnological information from the lake for a period of two years
		c	Collect biological data, including population estimates, age and growth data, size distribution, food consumption/predation rate, and standing crop estimates, for all major fish species
		d	Integrate and assess all past and current information on fish populations and environmental conditions to identify and address factors limiting the production and recruitment of important recreational fish species
3	Implement management intervention measures to restore recreational angling opportunity for bass, crappie, bluegill, perch and trout in Moses Lake	a	Implement habitat improvement, population control and/or regulatory measures to restore targeted recreational fisheries
		b	Monitor fish population and habitat response to management intervention measures and utilize principles of adaptive management to achieve goal of restoring fishery

***Objective schedules and costs***

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	05/98	09/99	18.4%
2	07/98	09/00	20.9%
3	10/00	09/03	60.7%

Schedule constraints.

Any schedule slippage would likely occur under the implementation objective and be the result of misdiagnosis of limiting factors

Completion date.

FY-03

**Section 5. Budget*****FY99 budget by line item***

Item	Note	FY99
Personnel	1 Bio 3, 2 Bio 1's = 3.0 FTEs	\$112,740.00
Fringe benefits		\$17,825.65
Supplies, materials, non-expendable property		\$2,500.00
Operations & maintenance		\$1,500.00
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Start-up equipment costs - Electrofishing boat, vehicle, sampling boat, hydrolab, nets, etc.	\$98,000.00
PIT tags	# of tags:	N/A
Travel		\$3,500.00
Indirect costs	@ 19% (except capital)	\$27,372.47
Subcontracts		\$6,000.00
Other		
TOTAL		\$269,438.12

***Out year costs***

Out year costs	FY2000	FY01	FY02	FY03
Total budget	\$158,000	\$214,000	\$220,000	\$228,000
O&M as % of total	0%	23%	22%	21%

**Section 6. Abstract**

The Moses Lake Fishery Restoration Project (NWPPC measure 10.8B.19) would determine factors contributing to the decline of important recreational resident species fisheries in Moaes Lake and implement a restoration program that would eliminate current constraints and restore once abundant fish populations and recreational fisheries. The project affords an ideal opportunity to increase recreational angling for resident fish stocks in the Columbia Basin to compensate for the loss of similar opportunity in the region due to hydropower development and operation within the mainstem Columbia River, where the habitat has been so severely altered that opportunities for compensation can not be realized.

The project will be carried-out in three phases, starting in FY98 and continuing through an implementation phase lasting through FY03. Phase one will examine all existing fishery, population and environmental information and collect critical non-existent data for limiting factors analysis. Phase two will investigate the most likely limiting factors utilizing sampling procedures and analysis methods developed by WDFW management and research staff for reservoir analysis, and phase three will involve implementation of recommended measures such as population control, habitat alteration, fishery regulation, stocking or others as determined by the study. Principles of adaptive management will be applied as various management strategies are applied and evaluated for effect. The expectation is that we will be able to identify key factors limiting production and implement some management strategies that will eliminate these constraints and restore the fishery in Moses Lake to its former level., producing more that 500,000 days of recreational angling annually.

## **Section 7. Project description**

### **a. Technical and/or scientific background.**

Moses Lake is a 6,800 acre natural lake located within the boundaries and hydraulic influence of the Columbia Basin Irrigation Project. The lake is heavily influenced by irrigation transport and return flows and has been enlarged and stabilized by construction of outlet control structures.

The lake was once the Premier crappie, bass, bluegill sunfish, perch, and trout fishery in central Washington. Beginning in the late 1970's and early 1980's, the fishery began a long and steady decline resulting in a fishery today dominated by walleye and thoroughly over-run by carp and bullheads. Relatively few bass prevail, and smallmouth bass have largely displaced the largemouth bass. Populations of crappie and bluegill are almost non-existent, and hatchery stocked trout exhibit poor survival.

A variety of theories have been forwarded regarding the factors that are responsible for the decline, but we have been unable to complete the detailed investigation required to more closely examine the possible causes. Funding for this project allows for a complete and through investigation of the fish populations, habitat (including water quality) and fisheries of Moses Lake and should lead to the restoration of fisheries, and a net gain in

recreational angling opportunity for resident species on the order of 250-500 thousand days a year.

This project provides an ideal opportunity to enhance recreational angling for resident fish species as compensation for hydropower losses. Moses Lake is located within an hours drive of the Columbia River in a portion of the River that has been severely altered by hydroelectric dams and where recreational angling opportunities for resident fish species have been lost.

b. Proposal objectives.

Objectives:

1. Determine factors limiting the fisheries for important recreational resident fish species including bass, bluegill, crappie, perch, and trout in Moses Lake.
2. Implement management strategies that address limiting factors to restore populations of important recreational resident fish species and their resulting fisheries to historic levels. Increase annual angler days from current 100,00-250,000 days per year to 500,000 days per year.

Products include:

1. Moses Lake Investigations Report which examines the fisheries and habitat information from Moses Lake, identifies limiting factors, and recommends management solutions to restore important fisheries.
2. Moses Lake Management Plan which includes public input on management priorities and specific management strategies.
3. A variety of restoration/enhancement projects, including habitat structures, water quality improvements, population removal efforts, fish stocking, and other projects as required.

c. Rationale and significance to Regional Programs.

Recreational angling opportunities for resident fish species have been irretrievably lost in this area of the Columbia River Basin as a direct result of the habitat alteration caused by hydroelectric dams and continuing operation of the hydroelectric system. It is not possible to compensate for this loss in place because of the altered system. This project directly addresses the loss of resident angling opportunity by providing 150-400,000 additional days of recreational angling annually within an hours drive of the impacted areas.

There are several Council projects that address lost opportunity for resident fish species above blocked areas, but very few that address these impacts below blocked areas. Demand for warmwater angling opportunity is the fastest growing activity in Washington. Very few opportunities to enhance these fisheries exist that do not have some potential impact on native fish and wildlife species. Moses Lake is one of those areas where the fishery can be enhanced without concern for impacting Columbia River salmon and steelhead populations.

d. Project history

The Moses Lake Fishery Restoration Project was first adopted into the Columbia Basin Fish and Wildlife Program in 1992. The project was rated high enough by the Resident Fish Committee to be eligible for funding for the first time in the FY98 (current) budget. A total of \$52,000 will be spent on this project beginning in March of 1998. This proposal would continue funding for the project through completion in 2003. No funding has been expended on this project as of the date of this application.

e. Methods.

Phase 1 of the Moses Lake Fishery Restoration Project will involve a complete review of all historic and current information on the fish populations, ecology and fisheries of Moses Lake. The information will be critically evaluated to determine if there are any obvious correlations between changes in any of these factors. If this assessment requires additional information be collected to complete this preliminary analysis, some limited new data may be collected. For example, if there appears to be a correlation between a shift in game fish populations the corresponds to a change in upland management practices and historic data is available on nutrient loading but no current data is available for comparison, this data may be collected to test the hypothesis.

Phase 2 of the study will be to use established methods and procedures to collect key fish population, habitat and fisheries information that would be used to evaluate possible limiting factors and determine which factors play the key role in controlling fish populations and determining the success of the recreational fishery. For example, if the decline in selected recreational fish species can be correlated to the introduction of walleye into the lake, we will be collecting baseline information on walleye interactions with other fish species by examining spacial, temporal life history over-laps in an effort to learn how to modify interactions to attain the over-all objectives of this project.

The third and final phase of the project will be to systematically implement some management strategies in an attempt to shift population balances to increase the productivity of target species, and thereby achieve the objective of increasing recreational angling opportunity. We expect that several strategies will be implemented and each will be monitored to see what impact it has on the fish population. We expect that monitoring population response will provide additional information which may lead to adjustments in

management strategies.

The most likely management strategies that may be applied include, various measures to change water quality/habitat parameters, including such actions as critical habitat placement, population exclusion, selective fertilization, watershed pollution abatement, etc. Various management strategies to shift populations may include selective carp removal, selective walleye removal, creation of nursery areas, additional fish stocking, etc. Harvest regulation may also be used to control the balance of populations, including the possibility of a establishing a subsidized commercial carp fishery.

We are very confident that the Moses Lake fishery can be restored to at least the historic level. The only thing that has kept this from happening has been a lack of funding to do the detailed analysis and implement management recommendations. Our experience with this type of project, however, makes us aware that there is an element of trial and error (adaptive management) to the project. We expect that it may take five years to affect a significant change in the population and achieve the over-all objective of the project.

f. Facilities and equipment.

Field office space for this project is available at the Columbia Basin Fish Hatchery. This project has relative high start-up equipment costs. A computer and office furniture will be purchased during FY98. In FY99 the following major equipment items will be required to complete all tasks; Boat/motor/trailer \$10,000; a second computer \$3,000; additional office furniture \$2,000; Hydrolab \$9,000; Vehicle \$24,000; Electrofishing boat \$38,000; and various nets \$12,000.

In years 2-5 a total of \$110,000 has been budgeted for various, as of yet unknown, enhancement projects. These projects include the cost on implementing such management strategies as selective carp removal, habitat placement, fish planting, etc.

g. References.

A complete literature review of information available relative to Moses Lake is the first activity listed for this project.

## **Section 8. Relationships to other projects**

This is not intended to duplicate the Relationships table in Section 3. Instead, it allows for more detailed descriptions of relationships, includes non-interdependent relationships, and includes those not limited to specific Bonneville projects.

This project is unique in the Council's Program because it addresses the issue of compensation for loss of recreational angling opportunity for resident fish species as a direct result of hydropower development and on-going operation activities. It addresses this issue in the only place it can be addressed, out-side the mainstem Columbia River channel, in areas where Columbia River waters have been diverted for agricultural

development.

This project will be closely coordinated with the U.S Bureau of Reclamation, East Columbia Basin Irrigation District, City of Moses Lake, Moses Lake Fishery Advisory Committee, and with the Warmwater Enhancement Program of the Washington Department of Fish and Wildlife.

## **Section 9. Key personnel**

The Moses Lake Fishery Restoration Project will receive slightly more than \$50,000 to initiate the work at the end of FY98. No personnel have been as of yet identified for this project. The project will be supervised by the Regional Fisheries Program Manager for Region 2 of the Washington Department of Fish and Wildlife, Joe Foster. Mr Foster has been a Biologist with the Department of Fish and Wildlife for 25 years, the last 15 as Regional Program Manager. He is very familiar with the issues and resources of Moses Lake and has vast experience in managing projects and budgets.

One Project Manager (Fish Biologist 3) and two Fish Biologists 1's will be hired for the project when funding becomes available. All of the personnel assigned to this project will exceed the requirements established for their positions by the Department of Fish and Wildlife and will be selected for their experience with the various research disciplines applicable to this project.

## **Section 10. Information/technology transfer**

Results of this project will be published in technical progress reports. Some scientific publication may also be considered depending on the nature and uniqueness of any findings. We plan to have a variety of public workshops over the course of this project to relay results to user groups and other interested parties and to solicit input on management strategies. This project will also receive considerable media attention because of the economic and social importance of the Moses Lake recreational fishery.